watershed focus

New Jersey Department of Environmental Protection · Division of Watershed Management

what's in focus

Winter 2006

OFFICE OF THE COMMISSIONER

A Message From Acting Commissioner Lisa P. Jackson

With deep humility, I accepted Governor Jon S. Corzine's nomination to serve as Commissioner of the New Jersey Department of Environmental Protection. In doing so, I renewed my commitment to furthering New Jersey's status as a national leader in public health and environmental protection and energy efficiency, while strictly adhering to the highest ethical standards.

I consider it a tremendous honor to lead the DEP's staff of highly skilled professionals dedicated to improving the quality of life for every New Jersey resident. Governor Corzine's decision to select a new commissioner from within our department it a tribute to their accomplishments in protecting, restoring and enhancing our environment and natural resources.

Together, we will champion the cause of environmental protection in every corner of New Jersey – fighting to protect low-income and urban communities overburdened by the adverse effects of industrial pollution; enacting tough, mandatory safety standards for New Jersey's chemical plants; improving air quality; strengthening safeguards for our critical drinking water resources; and preserving open space and our wealth of natural resources.

Above all, we will continue to strive for excellence, working every day to earn the trust of the people of New Jersey we are both proud and privileged to serve.

Greek Valerian, a native plant of New Jersey, can be used as part of a rain garden. Read more about rain gardens on Page 6. Photo taken by H. Ling.

watershed focus

is a publication concentrating on watershed management, stormwater and nonpoint source pollution management issues in New Jersey. Send comments and subscription requests to:

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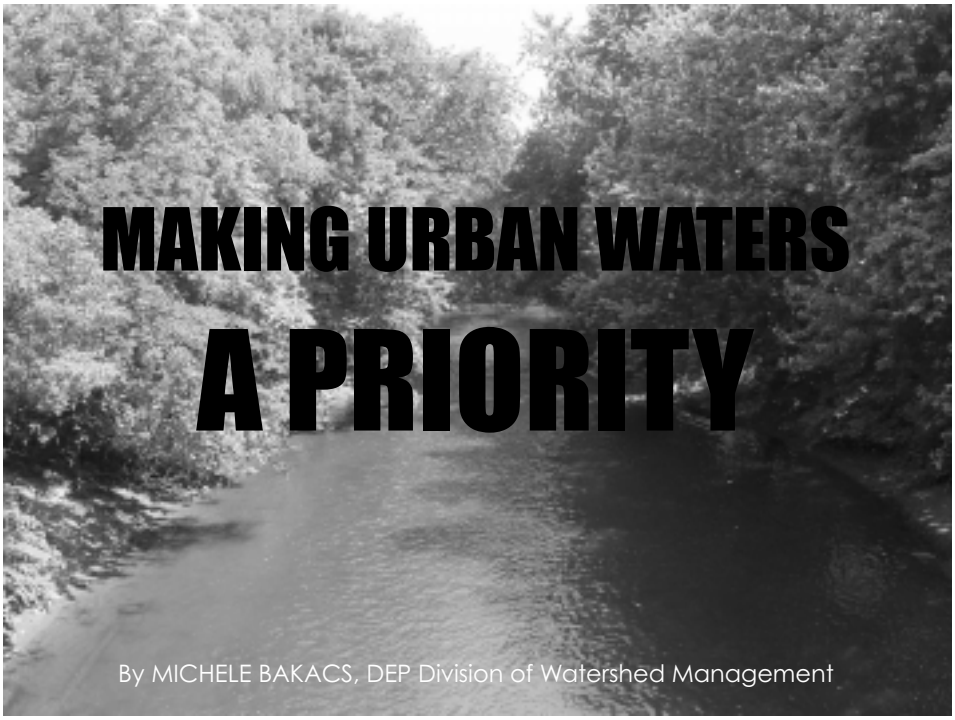
what's a watershed?

A watershed is the area of land that drains into a body of water such as a river, lake, stream or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. For example, the watershed of a lake would include not only the streams entering the lake but also the land area that drains into those streams and eventually the lake. Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams.



MAKING URBAN WATERS A PRIORITY

By MICHELE BAKACS, DEP Division of Watershed Management

As part of its effort to make urban waterways a priority for water quality protection, the Department of Environmental Protection is working with the Lower Passaic and Saddle River Alliance to help New Jerseyans recognize that the Passaic River can be a valuable resource, instead of perceiving it as a liability.

Originally formed from the Watershed Management Area 4 Public Advisory Committee, the alliance now includes more than 30 local community groups, businesses, state and federal agencies and residents dedicated to reclaiming and restoring the Lower Passaic Watershed. Their geographic focus is the Passaic River and its tributaries from Two Bridges in Wayne to Newark Bay.

Background

The Lower Passaic and Saddle River Watershed lies in the heart of the most densely populated region of New Jersey, the nation's most densely populated state. Located in northeastern New Jersey, this watershed encompasses 66 municipalities in parts of five counties: Bergen, Passaic, Essex, Morris and Hudson.

The watershed has long suffered the effects of urbanization, combined sewer overflows and a legacy of industrial pollution that has landed a portion of the riverbed in the Lower Passaic a place on the national Superfund list. Over time, communities have retreated from the river, largely surrendering it to industrial uses.

The alliance is now working to encourage communities to rediscover and reclaim the streams and rivers of the Lower Passaic and Saddle River Watershed.

From WMA 4 PAC to Alliance

The DEP initiated the WMA 4 PAC five years ago to assist Division of Watershed Management staff in identifying water quality issues, implementing Total Maximum

Daily Loads (TMDLs) and providing public outreach and educational programs in the Lower Passaic Watershed. Since its inception, the WMA 4 PAC has helped reverse long-held perceptions of urban waterways being as being too far gone for reclamation and restoration. During the past several years, the group has proven itself a vital entity and a voice for urban water quality protection in northeastern New Jersey.

Last spring, the WMA 4 PAC changed its name to the Lower Passaic and Saddle River Alliance to more effectively communicate its mission and geographic focus. The alliance is working to improve public access to the river, develop watershed restoration and protection plans, monitor tributaries for sources of pollution and work with its partner organizations to reconnect communities to the river.

Committee Activities

As a result of the alliance's hard work and dedication, it has attracted a diverse group of dedicated stakeholders working through its subcommittees: the Technical Advisory Committee, Education and Outreach Committee and the Open Space Committee.

The Technical Advisory Committee sets the water quality and restoration priorities for the watershed and works with their partners to accomplish them. In spring 2005, the Technical Advisory Committee partnered with William Paterson University and was awarded a grant from the Nonpoint Source Pollution Control and Management Federal Grant program (Section 319(h) of the Clean Water Act). Through the grant, the alliance will develop a watershed restoration and protection plan for Preakness Brook, a tributary of the Lower Passaic that flows through Wayne Township. The alliance will determine specific actions needed to protect the Category 1 headwaters and restore the impaired segments downstream. Stormwater management concerns in the Preakness subwatershed will also be addressed.

Additionally, the Technical Advisory Committee coordinates the water quality sampling on the streams deemed to be priority stream segments in the watershed. The sampling is done to help with fecal coliform source trackdown and to help develop a TMDL implementation plan for the priority stream segments.

The Education and Outreach Committee is working to reconnect local communities to the Passaic River, an often-overlooked urban treasure. Last May, the committee celebrated National Watershed Awareness Month by hosting teams of canoe and kayak racers on a 12-mile stretch of the Passaic River. More than 60 canoeists and kayakers competed at the Passaic River Paddle Relay. Participants enjoyed a beautiful day on a portion of the Passaic River that many typically would not normally think about exploring. The committee is already planning the next Paddle Relay to be held on May 13, 2006.

The Open Space Committee is completing a Geographic Information System project that will map opportunities for public access to the river and prioritize areas within the watershed for open space acquisition. In summer 2004, the alliance was awarded a technical assistance grant from the National Park Service, Rivers Trails and Conservation Assistance Program to develop a Passaic River water trail. The water trail would offer the public opportunities to experience the river from a different perspective. Existing and potential canoe and kayak access points would be mapped to raise awareness of the Passaic River as a public recreational resource and highlight the need for greater access.

For More Information

Making urban areas a priority for water quality protection is a vital part of the Bureau of Watershed Planning's work. In addition to the alliance, the Bureau of Watershed Planning is working with other groups throughout the New Jersey to improve the quality of our watersheds and foster public participation and environmental stewardship.

For more information about the alliance or to get involved with other watershed projects, call the DEP's Bureau of Watershed Planning at (609) 633-3812.

DEP Recognizes Environmental Excellence at Sixth Annual Awards Ceremony

The DEP named environmental leaders, businesses and communities as recipients of 2005 Environmental Excellence Awards, honoring them for their significant contributions to environmental protection in New Jersey.

Nominees were judged on the basis of documented environmental benefits, innovation and long-term impacts of their work in the environmental field. The nine award categories include achievements in Environmental Education, Clean Air, Clean and Plentiful Water, Safe and Healthy Communities, Land Conservation, Healthy Ecosystems, Innovative Technology, Environmental Stewardship and Environmental Leadership.

It was the sixth year the awards, cosponsored by the DEP, the New Jersey Corporation for Advanced Technology, and the NJ League of Municipalities, were presented to state environmental leaders.

Following are this year's watershed related recipients and honorable mentions:

Clean and Plentiful Water Winner
Lake Hopatcong Commission

The Lake Hopatcong Commission, created in 2001, functions as the steward of Lake Hopatcong. The LHC received its award for its phosphorus-free fertilizer campaign and aquatic weed-harvesting program to improve the lake's surface water quality. The commission works with governmental agencies and resident in the Lake Hopatcong Watershed to monitor, protect and restore the lake's water quality and its associated natural resources. At nearly 2,700 acres, Lake Hopatcong is New Jersey's largest inland lake with 38 miles of shoreline within the state's Highlands region.

Clean and Plentiful Water Honorable Mention
Delaware River Basin Commission

The Delaware River Basin Commission (DRBC) was formed in 1961 to share the responsibility of managing the water resources within the multi-state basin. The DRBC earned recognition for adopting a new rule that establishes pollutant minimization requirements for polychlorinated biphenyls in the Delaware River estuary. The commission has developed a regulatory tool - the Pollutant Minimization Plan - to achieve pollutant reductions. The commission's new plan regulation has great potential for widespread application to other bioaccumulative toxics.

Environmental Education Winner
Cub Scout Pack 30

Cub Scout Pack 30 earned its award for continuing efforts to improve the water quality of the Rahway River through organized clean-ups and educational outreach. Cub Scout Pack 30 operates out of St. John Apostle Church in Clark/ Linden. The pack attracts youth from urban and suburban communities including Linden, Rahway, Elizabeth, Clark and Cranford. The pack formally entered into an agreement with the County of Union under its Adopt-A-Park program. Under this program, the pack sponsors and organizes regular clean-up efforts in the Rahway River to promote the river's health and viability and educate youths and residents about their roles as environmental stewards.

Cinnaminson Students

continued from page 16

materials needed for the event. Elaine Mendelow, Memorial School's Project Challenge Program, organized this local water festival.

The water festival is part of a nationwide effort to promote water conservation and water resource management. These daylong festivals, the largest single-day water education events in the United States, are held in 131 towns nationwide. Filled with interactive activities that celebrate the critical role of water in our lives, the festivals teach children about the science and history of water.

The national effort is organized by Project WET (Water Education for Teachers), an international, interdisciplinary, water science and education program for formal and non-formal educators of K-12 students, with support from Nestle Waters North America and its local Poland Springs brand. The DEP's Division of Watershed Management and the New Jersey Audubon Society are co-sponsors of Project WET in New Jersey.

If you are interested in applying for a mini-grant to hold a water festival at your school in 2006, contact NJWET@dep.state.nj.us or visit www.nj.gov/dep/watershedmgt

Rain Gardens Sprouting in the Garden State

By CHRIS ALTOMARI, The Stony Brook-Millstone Watershed Association

A rain garden is simply a garden that captures rainwater, allowing it to soak naturally into the soil and reducing problems with runoff and standing water. A rain garden can also filter and reduce pollutants in runoff, such as nutrients and pesticides from lawn applications and oils and metals from cars and roads.

Along with providing a pleasing solution to runoff problems, a rain garden attracts butterflies, insects, birds and other wildlife.

Where These Gardens Grow

Create rain gardens in your own yard to address wet problem areas. Landscapers, builders, or volunteers also create rain gardens to enhance a lawn, park, neighborhood, school or even a median strip in a parking lot.

Designing a Rain Garden

Several factors will influence where and how you create your rain garden and the following information highlights some of these considerations. Planting drainage areas with flowers or shrubs may improve the site, but addressing drainage issues may also be necessary.

Site Considerations

When choosing a good location for your rain garden, consider where rain flows. You may want to construct the rain garden

Photo: H & M Ling

in an area where stormwater already accumulates. Determine if you can dig two feet without hitting shallow bedrock or water. Also, identify all utilities before you dig and maintain a safe distance from your home, approximately 30 feet.

Soil Infiltration

Your garden can be designed to either infiltrate stormwater or safely convey it to another drainage area. Evaluate your soil conditions because tight clay and shallow bedrock can make it difficult for rain to infiltrate the ground. To improve infiltration, you can add sand, gravel, and possibly a drainage pipe system, depending on your site conditions.

Excavate the garden lower than the surrounding area, in a concave fashion, to allow rain to flow to the garden bed. The garden should drain within 72 hours of rainfall to avoid standing water where mosquitos can breed.

Planting Bed

Replace the excavated soil to obtain a mixture of about half soil and half of a combination of sand and compost. This bed should be two feet to three feet thick. Adding a surface layer of mulch will help maintain moisture and control weeds.

Plant Selection

Consider using native plants for your rain garden. Local nurseries can help you with your selection of floral plants, bushes, sedges, shrubs and trees. Select plants based on their preference for wet conditions and tolerance for sun or shade. Native plants are uniquely suited to their environment and require less care.

Maintaining Rain Gardens

Healthy, dense and diverse plant growth ensures the effectiveness of a rain garden. As the plants mature over one or two years, your garden will become more effective. Maintain your garden by weeding, pruning and mulching during the growing seasons, and debris removal during the fall or winter.

Water the garden immediately after planting and during dry spells.

More Details

The Native Plant Society of New Jersey has published a detailed rain garden manual, which highlights construction details and plant selections. View the manual online at www.npsnj.org

The Stony Brook-Millstone Watershed Association constructed a demonstration rain garden at the Nature Center this past spring. See it in person or view it on their website at www.thewatershed.org

Rain Gardens and Stormwater

As a watershed becomes developed, trees shrubs and other plants are replaced with impervious surfaces such as roads, rooftops, parking lots and other hard surfaces that do not allow stormwater to soak into the ground. Without the plants to store and slow the flow of stormwater, stormwater runoff increases, leading to more flooding after storms, but reduced flow in streams in rivers during dry periods.

One way to reduce runoff is to keep stormwater onsite and allow it to infiltrate into the ground. Rain gardens are a small-scale, do-it-yourself method of reducing runoff by keeping stormwater onsite and allowing it to recharge ground water supplies.

NEW JERSEY WATERSHED AMBASSA
TO SERVE THEIR WATERSHED COMM

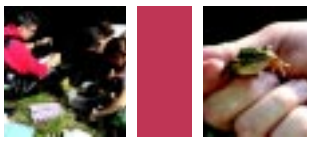
By MICHELLE RUGGIERO, Program Manager, New Jersey Watershed Ambassadors Program

Do you want to discover more about your watershed? Are you interested in learning about volunteer monitoring techniques? Are you looking for an exciting environmental presentation for your classroom or community group? If so, the New Jersey Watershed Ambassadors Program can help you.

The New Jersey Watershed Ambassadors Program is a community-based AmeriCorps program now in its sixth year. Through this program, AmeriCorps members participate in two weeks of intensive training in watershed management issues, volunteer monitoring techniques and presentation skills. The members are then placed in watershed management areas across the state, ready to serve their watershed communities.

Watershed Ambassadors monitor the rivers of New Jersey through Visual Assessment and Biological Assessment protocols. The members also train community volunteers in these two monitoring techniques. Members are available to make presentations to community organizations and schools, and provide information about water and watershed issues within New Jersey.

Created in 1993, AmeriCorps is a network of national service programs that engage more than 70,000 Americans each year in intensive service to meet critical needs in education, public safety, health, homeland security and the environment. AmeriCorps members serve through more than









DORS READY
UNITIES

3,000 nonprofits, public agencies and faith-based organizations. They tutor and mentor youth, build affordable housing, teach computer skills, clean parks and streams, run after-school programs, and help communities respond to disasters.

To schedule a presentation or to learn more about volunteer monitoring, please contact the Watershed Ambassador in your area. For more information about the program, contact Michelle Ruggiero, New Jersey Watershed Ambassadors Program Manager at (609) 292-2113.



WMA 1 - Upper Delaware
Douglas Jay - (908) 735-0733 x116

WMA 2 - Wallkill
Aaron Stark - (973) 579-6998 x133

WMA 3 - Pompton, Pequannock, Wanaque & Ramapo
Candice Stockdale - (973) 616-1006

WMA 4 - Lower Passaic & Saddle River
Gina Mongiello - (973) 817-5784

WMA 5 - Hackensack, Hudson & Pascack
Elyse Levy - (201) 968-0808 x105

WMA 6 - Upper & Mid Passaic, Whippany & Rockaway
Richard Park - (973) 635-6629

WMA 7 - Arthur Kill
Elizabeth Crawford - (908) 527-4032

WMA 8 - North & South Branch Raritan
Lawrence Lewis - (908) 234-1852 x18

WMA 9 - Lower Raritan, South River & Lawrence
Amy Groark - (908) 685-0315 x31

WMA 10 - Millstone
Allison Jackson - (609) 737-3735

WMA 11 - Central Delaware Tributaries
Anthony Geiger - (609) 883-9500 x246

WMA 12 - Monmouth
Kristin Habeck - (732) 431-7460 x2287

WMA 13 - Barnegat Bay
Allison Seavers - (732) 928-2360

WMA 14 - Mullica
Timothy Moore - (609) 812-0649

WMA 15 - Great Egg Harbor
Lauren Stebbins - (609) 272-6974

WMA 16 - Cape May
Dustin Miller - (609) 465-1082

WMA 17 - Maurice, Salem, Cohansey
Russell Bohl - (856) 825-3700 x4010

WMA 18 - Lower Delaware
Stacy Shaw - (856) 614-3664

WMA 19 - Rancocas Creek
Sonal Patel - (609) 859-8860 x17

WMA 20 - Assiscunk, Crosswicks & Doctors
Muriel Kiernan - (609) 586-9603

WATERSHED AMBASSADORS PLANT TREES TO GREET YOU

By ANTHONY GEIGER, New Jersey Watershed Ambassador

Camden, notorious for being America's most dangerous city, was graced with an encouraging show of some 30 volunteers who turned out early on Oct. 29 for Make a Difference Day. The objective: Plant 20 trees along the 800 and 900 blocks of Pearl Street, an area that has lost much natural plant life to impervious surfaces and pollution. The crew was 22 current and former New Jersey Water Ambassadors from across the state (some hailing from as far away as New York and Cape May), as well as members of the New Jersey Tree Foundation and Pearl Street residents.

After dividing into smaller teams, the crew began digging knee-deep holes about three-foot by three-foot square. As the day grew progressively more beautiful, so did the sidewalks along Pearl Street. The work was under way by 9 a.m. and finished by noon. "This has been the fastest Make a Difference Day I have ever been a part of," remarked Michelle Ruggiero, New Jersey Watershed Ambassadors Program manager.

The volunteer's enthusiasm was fueled by blessings from residents along the street and the feeling of contributing something valuable to the neighborhood. "If I show someone that I am willing to make a difference, then maybe they will adopt that willingness and carry it on," said Gina Mongiello. "This is my hope when participating in an event of this nature."

"It really makes a statement that the biggest frustration among the volunteers was that we really wanted to do more," said Candice Stockdale, of Sloatsburg, New York.

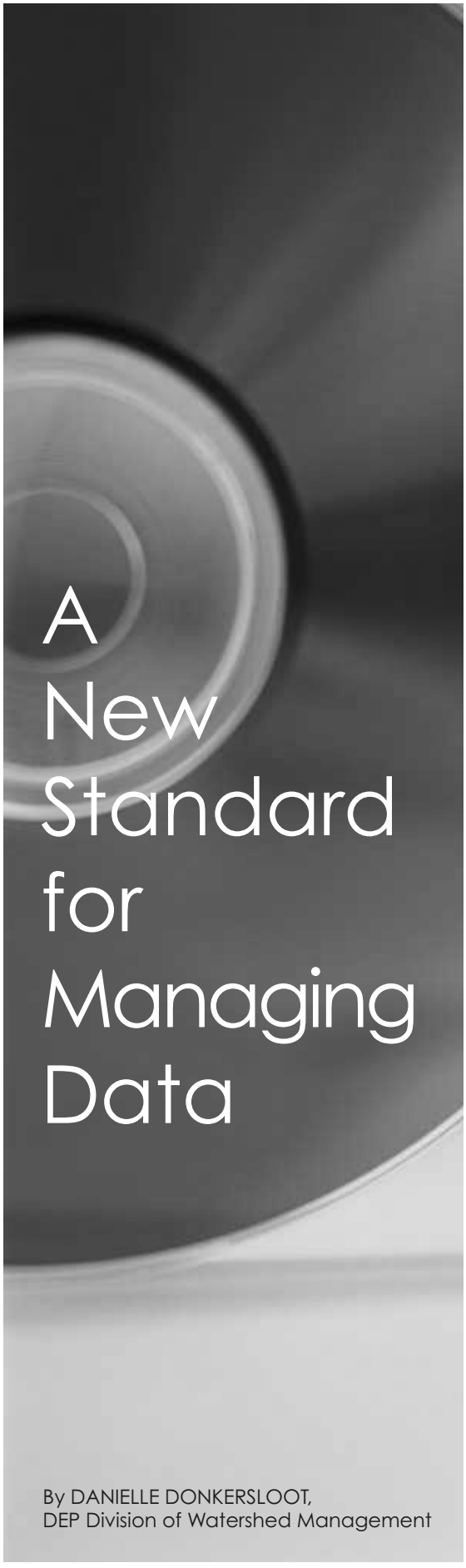
In addition to planting trees, the workers bagged a lot of fast food wrappers and assorted plastics littering the sidewalks and streets. The volunteers also marked storm drains with the words *No Dumping: Drains to River*, a message that should hit home for residents living within walking distance of the mighty Delaware River.

What did the residents say about the effort? Louise Woodard of Pearl Street summed up their sentiment by saying, "I am very happy with the tree planting , and all of the neighbors are so happy. It looks very nice. The trees have beautified the neighborhood, and we want to get the neighborhood cleaned up now. We really appreciate everyone who helped." said Woodard.

No strangers to hard work, the New Jersey Watershed Ambassadors are dedicated to keeping the Garden State's waterways clean and educating everyone about water quality. This group is part of AmeriCorps, a National Service Corps always willing to step up and address environmental issues.

Hosted by the New Jersey Tree Foundation, the event is part of Urban Airshed Reforestation Program. "It is beautiful to see people from all different walks of life come together to help plant the trees, and to see how the tree planting itself serves as a springboard for change in each neighborhood," said Jane Kim, New Jersey Tree Foundation. The foundation works to keep the garden in "Garden State" through tree planting, volunteerism and educational activities. The foundation donated the 20 saplings, 19 of which were serviceberry trees and one of which was horse chestnut. Foundation members also instructed the group on how to plant the trees properly.

For more information on the New Jersey Watershed Ambassadors Program please visit www.nj.gov/dep/watershedmgt/ambassadors_index.htm



A New Standard for Managing Data

By DANIELLE DONKERSLOOT,
DEP Division of Watershed Management

The DEP continuously looks to manage New Jersey's water resources more holistically and in doing so, all viable data sources must be reviewed. Recognizing the value of the data that New Jersey's volunteer monitoring community collects, this volunteer data and information has become part of the State's monitoring matrix over the past few years.

Working with the volunteer program coordinators around the state, the Watershed Watch Network, DEP's volunteer monitoring advisory group, has learned that many organizations have difficulty managing the data that they receive. Managing data requires it to be put into a data spreadsheet, for comparisons and then called out of the data spreadsheet to be used as a report.

The reports are designed to tell the story of the waterway. For example, they may answer questions. Is the water quality improving? Is it being degraded? Are there unexplainable changes in the data from one year to the next?

Managing data and getting the numbers and scores to actually mean something can be both time consuming and frustrating. Yet, volunteers want their time and effort in collecting the data to be used in a meaningful way.

Running the statistics, defining the changes to the water quality and graphing results can be a challenge to any organization. There are also the challenges of storing and protecting data. For example, what happens if the data is only stored on one computer and that computer crashes?

The DEP recognizes the challenges associated with collecting and managing data. Currently, the Watershed Watch Network is working to develop a user-friendly data management system with DEP data experts, a consulting firm and the volunteer program coordinators. This system would allow for data to flow into the DEP to use as well as allow for the data to flow out of the system for public use. This online data management system will help alleviate the burden of data management and allow for volunteer collected data to come to the DEP. The system will be a powerful tool for the volunteer community because it will allow volunteers to run simple statistics and create graphs for visual comparisons.

The resulting data management system will be an online electronic submission tool for local volunteer water monitors. This new system will allow the data to effectively managed, analyzed and reported for use by DEP, other interested organizations, the general public and the monitors themselves. With the project already underway, more details will follow in the coming months.

For more information, please contact Danielle Donkersloot at (609) 292-2113.

Third Annual New Jersey Volunteer Monitoring Summit Focuses on "Data Into Information Into Action"

By DANIELLE DONKERSLOOT, DEP Division of Watershed Management

The DEP, in cooperation with the Watershed Watch Network Advisory Council, hosted the Third Annual Volunteer Monitoring Summit last November in Edison. The conference provided an opportunity for New Jersey volunteer watershed monitors and those from across the nation to share information and techniques.

More than 100 people attended the two-day summit that featured presentations, hands-on demonstrations and networking with both local and national associations. In addition to volunteers, participants included federal, state, local government staff, private and public partners, watershed associations and academicians.

The conference showcased the work volunteers are doing in their watersheds as well as with the public and regulatory agencies. Presentations spotlighted examples of excellent data- and information-sharing that improved local decision-making.

Two speakers from the national stage – Geoff Dates, of the River Network, and Anna Eleria, representing the Charles River Watershed Association, discussed the ways in which information and data is being used in other states and offered New Jersey volunteers ideas about using their own data. Other presentations included:

- **Pompeston Creek Watershed Association**
- **Delaware Riverkeeper Network**
- **Stony Brook Millstone Watershed Association**
- **Rutgers Environmental Research Clinic and the Teaneck Creek Conservancy**
- **New Jersey Geological Survey Ambient Ground Water Quality Network**
- **South Branch Watershed Association and Vertices consultants**
- **DEP, Bureau of Marine Water Monitoring**
- **U.S. Environmental Protection Agency, Region 2**
- **DEP, Recognizing and Reporting Water Pollution Problems**
- **Rutgers Cooperative Research and Extension Water Resources Program**
- **Stroud Water Resource Center**
- **Remington and Vernick Engineers**

To view the presentations, visit www.nj.gov/dep/watershedmgt/volunteer_monitoring.htm Earlier summit presentations are also available in the website's archive section.

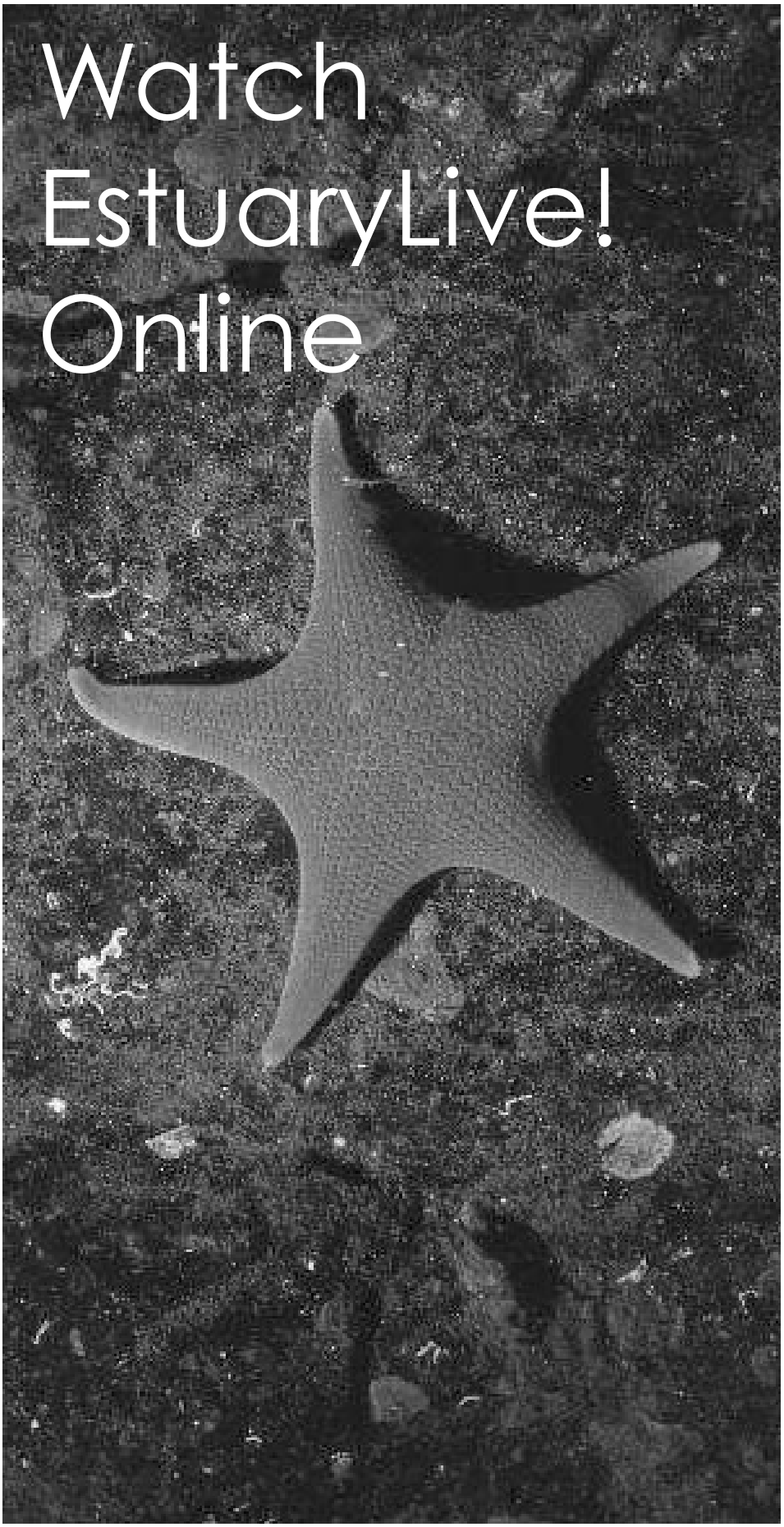
A GUIDE TO HIGHLANDS WATER PROTECTION AND PLANNING ACT

The Municipal Role in Implementing the Highlands Act

The Division of Watershed Management has released informational guidance with tips to assist municipalities in implementing the Highlands Water Protection and Planning Act. The document is mainly centered on the term "Major Highlands Development" - specifically related to single-family homes, exemptions dealing with single-family homes, and other types of small residential development. This informational guidance informs municipalities on how to handle these types of projects and gives examples of situations where a project may seem straightforward and exempt, but is not exempt and explains why. Questions regarding the Highlands Applicability Determination should be referred to the Bureau of Watershed Regulation at (609) 984-6888.

The informational guidance can be found on the DEP website at www.nj.gov/dep/highlands

Watch EstuaryLive! Online



EstuaryLive! kicked off the 2005 National Estuaries Day celebration last fall by offering free, live Internet field trips to five different estuaries around the nation. Designed as an interactive exercise for classrooms, this program can be viewed by anyone. It's not too late to participate in these field trips by watching the archived 2005 field trips at www.estuaries.gov/elive.html

The 2005 program featured six field trips from around the nation, including two from New Jersey:

- **New York-New Jersey Harbor Estuary Program, New Jersey**
- **Jacques Cousteau National Estuarine Research Reserve (NERR) and Barnegat Bay National Estuary Program (NEP), New Jersey**
- **San Francisco Bay NERR, California**
- **Tillamook Bay NEP and South Slough NERR, Oregon**
- **Grand Bay NERR and Mobile Bay NEP, Alabama**
- **Coast to Coast Program (Alabama, New Jersey and Oregon)**

During the program, naturalists from National Oceanic and Atmospheric Administration's Estuarine Research Reserve System and U.S. Environmental Protection Agency's National Estuary Program take participants on a journey through each unique ecosystem. Participants can now view these archived field trips online.

New York-New Jersey Harbor Estuary Field Trip *Overview*

The field trip introduces students to the New York-New Jersey Harbor Estuary through a series of interactive segments on the following topics:

Water Chemistry - explore the importance of salinity and dissolved oxygen in an estuary and introduce students to various measurement techniques.

Aquatic Organisms - use a seine net to collect and examine the fish and other aquatic organisms living in the Harbor Estuary.

Habitat - visit a restored salt marsh and learn how it provides important habitat for wildlife and benefits to humans.

Vegetation - introduce students to the plants growing on the beach and discuss some of their adaptions to this environment.

Beach Combing - conduct beach transects to collect, identify and count the natural and man-made items present on the beach and discuss how they may have gotten there.

Shipping Port - learn why ports are often established in estuaries and explore their own role in the transportation of goods.

Stewardship - contemplate the actions they can take to help protect and restore the health of estuaries.

Jacques Cousteau National Estuarine Research Reserve and Barnegat Bay National Estuary Program Field Trip *Overview*

The agenda for this site was developed to reflect the unique character of the two estuarine systems: Barnegat Bay and Great Bay. The broadcast explores the role of estuaries as nurseries for many important plant and animal species. Students will meet research scientists and learn how they are tagging and tracking animals, including striped bass and diamondback terrapin turtles, throughout the estuary. Students will also discover the cultural history of the estuary with a local clammer.

The program seeks to help participants understand and appreciate estuaries as collections of diverse, connected habitats that serve as critical nurseries for many marine and terrestrial organisms. The field trip is designed for grades 3 through 12. After the field trip, students will be able to:

· Physically define an estuary as an area of the coast where saltwater from the ocean meets and mixes with freshwater from a river

· Identify at least three important functions of an estuary (providing protection from coastal storms and flooding, filtering excess nutrients and pollutants from our water, serving as a nursery for many different types of organisms)

· Identify at least three organisms that rely on the estuary for all or part of their lives

· Provide at least one example of the cultural history that connects people and estuarine organisms in southern New Jersey

Both field trip websites also include links to support materials including lesson plans for teachers.

Cinnaminson Students

By ELAINE MENDELOW, Cinnaminson School

part of nation's largest single-day water education event

More than 300 students, teachers, presenters, volunteers and honored guests participated in the fourth Annual Make A Splash! Water Festival last September at Palmyra Cove Nature Park.

Students from Rush Intermediate School in Cinnaminson participated in 18 learning stations, listened to a keynote speaker and took part in a Water Wizards Challenge. Station

presenters came from many organizations including the DEP, New Jersey Geological Survey, Watershed Ambassadors, Rancocas Nature Center, Burlington County Mosquito Control, Palmyra Cove Nature Park, Pompeston Creek Watershed Association, and included volunteer parents and high school environmental students.

The event sponsors were the New Jersey American Water Company, Cinnaminson Clean Communities Program, the Burlington County Bridge Commission, Commerce Bank, Palmyra Cove Nature Park, Cinnaminson Education Foundation and the New Jersey Education Association PRIDE program. Local businesses donated prizes and other

CINNAMINSON STUDENTS continued on page 5

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